Where Do We Stand in 2003?

A Status Report on Technology in Tennessee Schools
2002-2003 EdTech in Tennessee Online Technology Evaluation (E-TOTE) Survey

E-TOTE
EdTech
Tennessee Online
Technology Evaluation System

About the Inventory

The E-TOTE survey marks the start of a yearly snapshot of the use of technology in Tennessee K-12 public schools and is the first of its kind in the state. This statewide inventory will be completed annually at each school by a person designated by the principal. Its data will help measure progress toward specified targets in key areas. Information from this first year sets the baseline for measuring future progress.

The key target areas are the goals specified by the Enhancing Education Through Technology Act of 2001[1] (Title II Part D of No Child Left Behind). The goals are:

- Improving student academic achievement through the use of technology,
- advancing student technology literacy, and
- encouraging effective integration with teacher training to establish instructional methods and best practices.

Key to achieving these goals is providing all students with access to technology resources and developing teacher competence in using technology to meet instructional goals.

The Tennessee Department of Education is pleased to release the online reports to the public. Available at http://tn.ontargetus.com/TNReports, the reports provide comprehensive data, including both state and local district summaries. As our audience reads this report, we encourage them to do so with alongside the online reports. These online reports present state-wide averages as well as district averages compared to state averages. In subsequent years, these reports will provide longitudinal data, comparing one year's data with the prior collections.

An important feature of the report is the correlation of the data with the state School Nutrition Program's database of student enrollment in the Free and Reduced Meals Program (F/R%), which makes it possible to look at the extent of Tennessee's "Digital Divide".

Access to the data will help school districts assess needs that are key to developing long-range strategic technology plans. Each school can also use its data as part of its school improvement process.

The Department of Education thanks the local school systems, their Directors, principals, and technology coordinators who provided the data in a timely manner. Thanks is also due AWS Convergence Technologies, Inc., a Maryland based internet and educational technology company, which built and operates the technology inventory system.

The project is funded by a portion of the state's portion of its Title II Part D project administration funds (CFDA #84-318X). The purpose of this document is to provide an overview of the E-TOTE survey process, elements, and reports. [2]

[1] Available online http://www.ed.gov/legislation/ESEA02/pg34.html

Digital Divide Analysis

The first E-TOTE 2003 report presented is the Digital Divide report. These graphs provide quantitative summaries of the extent of a digital divide in Tennessee schools. The data have been compiled using the most up-to-date information available on technology resources in Tennessee Schools (E-TOTE of February 2003) and data from the state's School Nutrition Program (F/R%).

Survey results were plotted according to of the percentage of students enrolled in the Free and Reduced Meals program. For the purposes of these reports, schools with a F/R% greater than 70% are considered "high poverty" schools and schools less than 11% are considered to be "low poverty" or affluent schools. As shown below, 121 schools were in the "affluent" category with free/reduced lunch percentage less than 11 percent. On the other hand, 358 schools were classified as high poverty, having free-reduced percentages of greater than 70%. The largest number (871) of schools have 31-70% free-reduced lunch.

Digital Divide: Free/Reduced Lunch Percentages

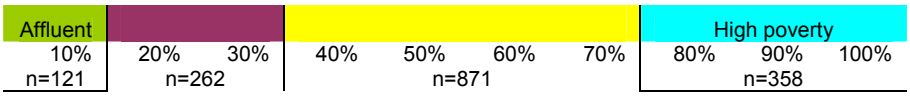


Figure 1: Digital Divide Poverty Categories

1. ***Student to Computer Ratio***[3]. The smaller the number of students per computer, the greater the access to computers the students are able to have in a school. Historical data drawn from EdWeek's annual Technology Counts report[4] used Tennessee data reported on the basis of high/low minority enrollment instead of poverty (free/reduced lunch). Recent EdWeek data do not provide a comparable for the digital divide gap, but they do demonstrate a significant improvement in the student to computer ratio between 2000 and 2001.

Student to computer ratio (all computers)	EdWeek 2001 (2000)	EdWeek 2002 (2001)	E-TOTE 2003 (2002)
Low-minority	8.9	n/a	3.7
High minority	12.3	5.4	4.1
GAP	3.3		0.4

Figure 2: Student to computer ratio (all types)

The E-TOTE 2003 data for all computers show the statewide student to computer ratio stands at 3.9:1[5]. Data for all computers disaggregated by poverty show that a very small gap does remain—less than half a student (3.71 vs. 4.11). When looking only at the higher capacity computers, the gap is larger: affluent schools average 4.55 students per computer, while high poverty schools have 5.45 students per computer.

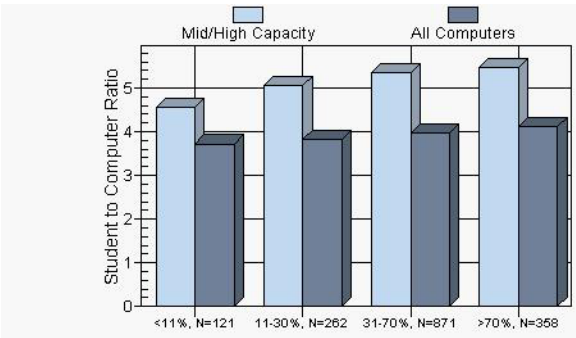


Figure 3: E-TOTE 2003

[2] Download a copy of the survey items from www.state.tn.us/education/acctE-TOTEsurvey2003.pdf
[3] All Digital Divide reports are available online: http://tn.ontargetus.com/TNReports/digitaldivide.asp
[4] Education Week. Technology Counts 2001. Available online http://www.edweek.org/sreports/tc01/
[5] See http://tn.ontargetus.com/TNReports/statesum.asp in online E-TOTE report.

2. *Classrooms Connected to the Internet*

Figure 4 looks at the percentage of classrooms that have at least one computer connected to the Internet for student and teacher use. The graph divides the schools according to their free/reduced lunch figures. In all except the most affluent schools, 75% of all classrooms have at least one internet computer for student use. The classroom percentage in affluent schools is 85%. The second section of the graph shows the percentage of classrooms having an internet computer for teacher use. The gap for teacher computers is larger: in affluent schools, 90% of the classrooms have internet computers for teachers to use, while in the poorest schools, only 78% do.

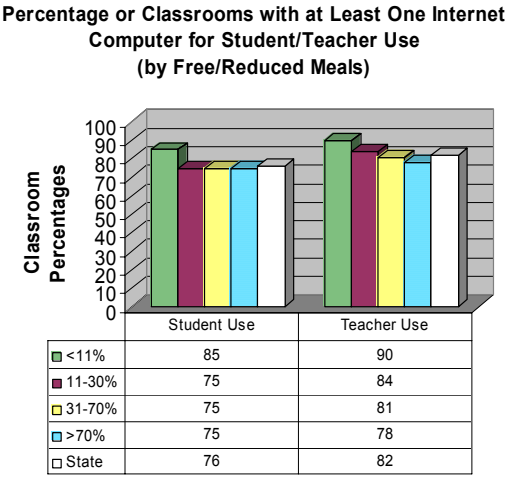


Figure 4: Classrooms Connected to Internet

3. *Student Technology Literacy*

Ten items in the E-TOTE survey looked at student technology literacy. What percentage of the students in free-reduced lunch ranges were technology literate in each of these 5 areas? Schools with the highest fee and reduced meals (shown with the widest bar) had the lowest percentage of students considered "literate" in each of these five areas. Students from schools with the lowest free and reduced meals scored highest in only one category: #5, productivity and multimedia tools. There, the gap between the poorest and the most affluent is also the greatest: 18 points. In all five items, schools with high poverty had the lowest percentage of students considered technology literate.

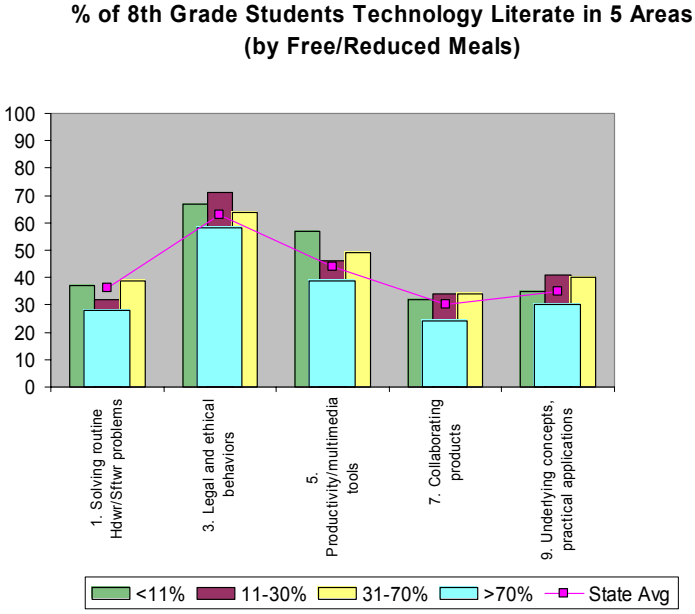


Figure 5: Eighth Grade Tech Literacy

(The five items disaggregated for the digital divide report were:
#1. Solving routine hardware/software problems
#3. Legal and ethical behaviors
#5. Productivity/ multimedia tools
#7. Collaborating with projects
#9. Underlying concepts, practical applications

4. STaR Chart

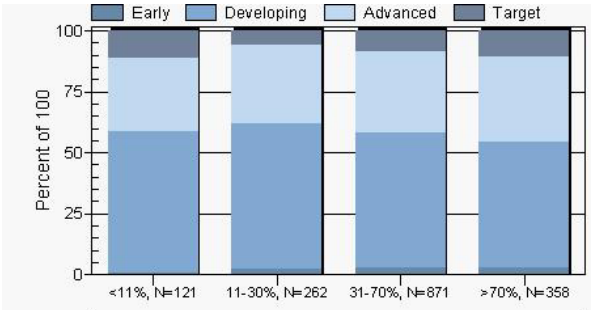
Five out of 22 STaR chart areas were disaggregated as part of the Digital Divide report. They reveal:

Impact of Technology on Teacher Role and Collaborative Learning (Item A): Teachers in affluent schools are more likely to have students using technology for cooperative projects in their own classrooms (developing) than for individual projects (early). In other schools, teachers are more equally divided between the early and developing level of impact.

Patterns of Teacher Use of Technology (Item B): Using technology as a supplement (early) characterizes a significantly larger percentage of teachers in high poverty schools. The predominant use in non-poverty schools tends toward using technology to streamline administrative functions (developing). Statewide, whether poverty or not, about one third of teachers use technology for research, lesson planning, presentations, and correspondence (advanced).

Frequency/Design of Instructional Setting Using Digital Content (Item C). Having only occasional computer use in the library or lab setting is considered a low score. Students in high-poverty schools are less likely to be in schools characterized at this low level (19%) than the state average (25%) or their affluent peers (29.8%). These same high-poverty schools report the highest percentage in each of the other levels: [developing-38%] regular weekly computer use to supplement classroom instruction, primarily in lab and library settings; [advanced-33%] regular weekly use integrated into curriculum activities in various settings; and [target-5%] on-demand access for completing activities seamlessly integrated into all core areas.

Curriculum Areas (Item D): In over 50% of schools reporting statewide, the use of technology in core curriculum areas is at the Developing stage, which is characterized by some minimal integration. At this stage, the digital divide is small. In contrast, the high-poverty schools do show a slightly higher percentage of schools at the Advanced level, characterized by integrating into separate core subject areas. The percentage of high-poverty schools considering technology integral to all subject areas (Target level) approached that of the affluent schools, but both percentages for this target are around 10%.



	<11%, N=121	11-30%, N=262	31-70%, N=871	>70%, N=358
Early	0.9%	2.5%	2.8%	2.8%
Developing	57.9%	59.3%	55.5%	51.8%
Advanced	29.8%	32.4%	33.1%	34.6%
Target	11.4%	5.8%	8.7%	10.7%

Figure 6: STaR Chart D (Curriculum Areas)

Patterns of Student Use (Item F): Little distinction can be seen in the patterns of student use based on poverty. Statewide, the levels cluster around early and developing. At the early stage, students occasionally use software applications and/or tutorial drill and practice software. This characterizes roughly half of the schools. At the developing stage, student use is regular and individual, for accessing electronic information and for projects. Slightly more affluent schools (41%) fit in this developing category than do the high-poverty schools (38%). Roughly the top ten percent of schools in every category fit in either the advanced or target area. The division between advanced and target favors the affluent schools over the high-poverty schools.

5. Home Internet Access

The Digital Divide is the most pronounced with home Internet access, especially student home Internet access. While the statewide average for student home Internet access is 51% and over three-quarters of the students from affluent homes have home Internet, less than one-third of high-poverty students do. While not as dramatic, faculty home Internet access also illustrates a digital divide. State average is 80%, with 86% from affluent schools and 76% from high-poverty schools.

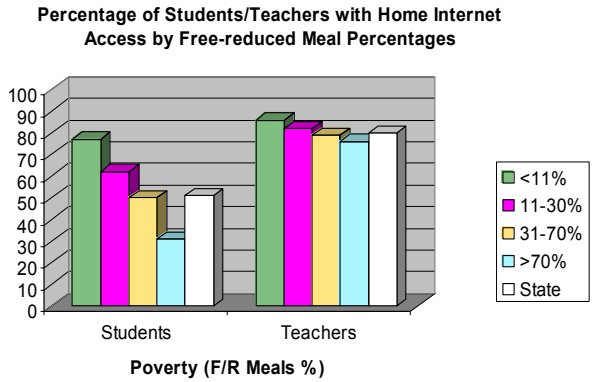


Figure 7: Home Internet Access

Statewide and District Summary Reports

The 2003 E-TOTE Reports present data for each section of the survey. While data were collected at the individual school level, the 2003 reports present to the public the state and district averages. Individual school districts have controlled access to their individual school reports, and each individual school has controlled access to its own reports.

Use the State Table of Contents page[6] to select an individual data group. These online reports give the statewide data and then display a table of district by district data for the particular data item.

We encourage district and school technology planners to use their E-TOTE 2003 data reports as they make infrastructure plans, structure professional development opportunities, and design embedded student technology literacy implementations and assessments.

Here, we explain the data items and make note of any particularly striking findings. Since we do not intend to repeat all the data in this summary document, be sure to refer to the online report for the complete data picture.

Section 1: Profile Data[7]

In a district-level profile, E-TOTE collected the number of technicians and technology trainers (in full-time equivalents). These figures were used to compute the average computer-to-technician ratio and the teacher-to-trainer ratio. While every district assigns an employee with the responsibilities of "technology coordinator," this position is a full-time position in only 79% of the districts. With 247,645 computers statewide, the computer-to-technician ratio is 633 to 1. Only 39% of school districts have someone on staff that serves at least part-time in the capacity of technology trainer for teachers. With 62,046 teachers in the state, the teacher-to-trainer ratio is 477 to 1.

Other district profile information included data on use of the state internet backbone; existence of district web page, hosting of school web pages, and presence of web master; type of e-mail service, and policy on student e-mail use at school.

[6] State Table of Contents Report: http://tn.ontargetus.com/TNReports/stateTOC.asp

[7] State Summary report: http://tn.ontargetus.com/TNReports/StateSum.asp. Controlled access reports are available, via password, from http://tn.ontargetus.com/

The ConnecTEN initiative has been hailed by some as the first statewide K-12 internet backbone in the country. In 2003, 81% of Tennessee's public school districts relied totally on the state backbone for internet service to individual schools. Fourteen percent use the state backbone to connect to a single egress point in the district; and 5% report not using the state internet backbone at all.

Most (95%) school districts have a district home page, and a significant portion of the districts host web pages for schools in their district (73%). However, only half of the school districts report having either a part- or full-time web master.

In addition to providing web access to schools, the ConnecTEN initiative also provides free e-mail accounts to public school educators in Tennessee. For 43% of the districts, these "ten-nash" accounts are their only official e-mail service. While sixteen percent of the districts use only their own district e-mail server, 41% use both the state and their own district e-mail service.

Student e-mail is another matter entirely. Here, the vast majority of school districts (66%) have policies that ban students from using e-mail at school. There are, however, nine school systems that provide e-mail to students from their own district e-mail server. And 27% of the districts do permit student use of free web-based e-mail at school.

At the school level, the profile collected the numbers of students, teachers, classrooms, and computer labs to provide comparable information from district to district. Student counts were used to calculate the student-to-computer ratio. (For E-TOTE 2003, computer capacities were defined in general terms by processor.[8] By virtue of the 2003 definitions, both mid and high capacity computers were assumed to be multi-media capable.)

Section 2: STaR Chart[9]

Tennessee first requested districts to collect the School Technology and Readiness (STaR) Chart information from every school in the Spring of 2002. This collection was in conjunction with the annual local consolidated application for federal funds and was required as part of the Title II Part D segment of the application. The STaR chart was subsequently revised to make it more sensitive to school-level indicators. The E-TOTE survey then incorporated this revised STaR Chart into its E-TOTE survey.

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[8] High Capacity (Pentium III or Macintosh G4 or higher); Mid Capacity (Pentium II or Macintosh G3); Low Capacity [Thin Client, Pentium, 486 processors or 68040 processors (Macintosh, Centris, Quadra, LC475, LC575, LC 580) that are still in use]

[9] In 1996, the CEO Forum on Education and Technology initiated a five-year project which developed an annual assessment of the nation's progress toward integrating technology into American classrooms (www.ceoforum.org/about.cfm). When the project was completed at the end of 2001, it had created a K-12 School Technology and Readiness (STaR) Chart to be used in assessing a school's level of readiness in using technology. Tennessee informally adopted this rubric when it required its applicants for the Technology Literacy Challenge Fund (2001) pilot school program to use it as part of their needs analysis. The subsequent statewide use of the STaR chart in 2002 used a Texas modified version of the original CEO Forum STaR chart. Acknowledgement is due the Educational Technology Advisory Committee of the Texas Education Agency which graciously granted permission to the Tennessee Department of Education to adopt and adapt its STaR Chart.

A tabular version of the Tennessee STaR Chart is available online at http://www.state.tn.us/education/acctstar-campus-portrait.doc

The STaR Chart gives school principals a 22-point questionnaire to evaluate a school's readiness to use technology. The four main areas in the STaR chart looked at the use of technology in Teaching and Learning, the Educators' Preparation and Development, the use of technology by Administration and the Support Services surrounding it, and the Infrastructure for Technology. The six STaR Chart items that the state proposed to use in its report to the U. S. Department of Education on progress toward achieving the goals of Title II Part D of the No Child Left Behind Act are:

1. What difference does technology make in the teacher's role and in collaborative learning? (*A)
2. How do teachers use technology? (*B)
3. How thoroughly is technology used in each of the curriculum areas? (*D)
4. How do students use technology? (*F)
5. What percentages of the teachers meet the ISTE technology proficiencies? (*H)
6. How many students are there for each internet-connected multi-media computer and how frequently does the school system replace the computers? (*R)

Each item in the STaR chart is scored independently of the others. By choosing the answer that "best fits" the school picture, the school identifies its current status as early, developing, advanced, or target. Items are grouped into four main categories. The categories are Teaching and Learning, Educator Preparation and Development, Administration and Support Services, Infrastructure for Technology. The category's score is calculated by averaging the scores for the items in that category. Thus, the six indicators for Teaching and Learning are used to compute a single Teaching and Learning score.

When reporting STaR Chart results in the Digital Divide report, the stacked bar chart design was chosen in order that readers might readily see where the largest proportion of the state schools are found. The detailed state level report, however, reverted to presenting the percentage of schools that self-scored at each of the four levels.

Taken as a whole, all four of the main STaR chart categories are, not surprisingly, at the "developing" state. Because of this averaging effect, it is more informative to examine the indicators individually. Viewing the twenty-two individual indicators statewide, two are at the early stage; sixteen are developing; and four are advanced. No statewide indicator is yet at the target level.

2003 STaR Chart Levels Before/After "Developing"

EARLY	DEVELOPING	ADVANCED
• Technology Budget Allocated to Technology Professional Development (L) • Distance Learning (T)	• Impact on Teacher Role (A) • Patterns of Teacher Use (B) • Frequency/Design of Instruction Setting (C) • Technology Applications Assessment (E) • Patterns of Student Use (F) • Content of Training (G) • Capabilities of Educators (H) • Leadership Capabilities of Administrators (I) • Models of Professional Development (J) • Levels of Understanding and Patterns of Use (K) • Vision and Planning (M) • Technical Support (N) • Instructional and Administrative Staffing (O) • Budget (P) • Students per Computer (R) • Other Technologies (V)	• Curriculum Areas (D) • Funding (Q) • Internet Access Connectivity/Speed (S) • LAN/WAN (U)

Figure 8: STaR Chart Indicators: Early, Developing, Advanced

In light of Title II Part D's mandate that 25% of the funds be designated for technology integration professional development, it is interesting to note the contrast that E-TOTE 2003 brings to light: Schools

rated funding (item Q) advanced while they rated the percentage of the technology budget that is allocated to technology professional development (item L) at the early level. E-TOTE 2003 coincided with the onset of the first full year implementation of Title II Part D requirements.

In the performance indicators submitted to the U.S. Department of Education[10], Tennessee stated target areas for several STaR Chart items. According to E-TOTE 2003, two of the six have already been accomplished.

	R: Students per computer	F: Patterns of Student Use	H: Capabilities of Educators	B: Patterns of Teacher Use	D: Curriculum Areas	A: Impact on Teacher role, Collab learning
E-TOTE 2003	Developing	Developing	Developing	Developing	Advanced	Developing
Goal	Developing (5-9 to 1); refresh every 5 years	Advanced: collaborate to evaluate, analyze, problem solve; select appropriate technology	Target: 100% meet ISTE technology proficiencies and implement in classroom	Advanced: Use tech for research, lesson planning, multimedia and presentations; to correspond	Advanced: Tech integrated into core subject areas, activities separated by subject and grade	Advanced: Teacher facilitated learning; students use tech to create communities of inquiry

Figure 9: Baseline Status of Performance Indicators

Section 3: Equipment Reports

School districts continue to invest in placing computer equipment in schools so that students can use them as tools in learning important core content. The equipment reports show where the computers are located in the schools and how many computers tend to be in individual classrooms. With the Internet available to every school, another part of the picture is how many classrooms have internet-connected computers available for students to use. The extent to which the Internet is available to students is also shown in how many computers in all locations are connected to the Internet.

One way schools can get more use from the computers they have is to move them from classroom to classroom on days when students are working on projects. Using wireless or laptop computers makes this much easier. When classes use computers in whole group instruction, various kinds of projection devices let all children see the computer display. The projection device portion of the equipment reports tell what kinds of projectors are used and where they are found. These projection devices include the large screen television such as those which equipped the state's "21st Century Classroom" model, LCD panels, and interactive whiteboards.

Computer Count by Location. [11]

Where do the high capacity computers tend to be clustered in Tennessee schools?

By far, the locations with the highest concentration of high capacity computers are the offices. However, offices account for only 5% of all the computers in schools. By contrast, 65% of the computers are located in classrooms, with 18% in computer labs, and 6% in libraries. Classrooms account for 80% of the total number of low capacity computers. Still, most classroom computers are mid-capacity (39%). Computer labs have a higher percentage of high capacity computers (44%) than do classrooms (32%). (See figure 10).

[10] http://www.state.tn.us/education/acctedtech5.htm
[11] http://tn.ontargetus.com/TNReports/ComputerCount_State.asp

Location	% of High Capacity Computers	% of Mid Capacity Computers	% of Low Capacity Computers	Total in Location	Capacity Distribution Percentages by Location: % High	% Mid	% Low		Location Distrib. ALL Capacities
Office	8%	5%	2%	12,458	54%	36%	10%	100%	5%
Classroom	57%	64%	80%	161,114	32%	39%	29%	100%	65%
Computer Labs	21%	17%	13%	44,041	44%	39%	17%	100%	18%
Library	6%	6%	5%	14,416	39%	42%	20%	100%*	6%
Mobile	8%	8%	1%	15,616	44%	54%	3%	100%*	6%
All Locations	100%	100%	100%	247,645	36%	40%	24%		100%

* Distribution totals greater than 100% are due to rounding.

Figure 10: Computer Count by Location

Classrooms Connected to the Internet. Internet connectivity is high in Tennessee. Every school in the state has Internet access. While every classroom does not have Internet access, classroom connectivity is still relatively high, with 76% of classrooms having at least one computer connected to the Internet for student use with 6% more providing teacher Internet access. The statewide average is 3.81 internet-connected computers per classroom. This statewide average suggests there may be sufficient computers to provide several internet-capable computers for every classroom. Data collected at the school level shows every school has enough internet-connected computers to place one in each classroom.[12] How they are actually distributed is a local decision.

Student-Computer Ratio. District-wide averages for student to computer ratio vary widely. The ratio for higher capacity computers ranges from 13:1 to 1.9:1. For all computers, the range is almost as wide: from 12.7:1 to 1.5:1.

Computer Projection Devices. Fifty-five percent of classrooms have some type of device for projecting the computer screen image. The percentage (78%) is significantly higher in labs. While labs represent only 3.6% of the "rooms" counted for projection devices, they do account for a slightly higher proportion (4.85%) of the total number of projection devices.

Dominant Operating System/Platform.[13] Twenty-five percent of Tennessee K-12 public schools report having a mixed operating system platform environment. Windows is clearly the dominant platform, with 56% of schools reporting a "Windows-only" and another 11% reporting a mixed environment with Windows predominating. Some few schools did report "Other" for an operating system, although this is not statistically significant. Three of these schools report DOS as the dominant operating system for their computers. Macintosh is the sole platform in 19% of schools and dominant in another 14%. (We did not survey the operating system used for district offices or those used as web or file servers.)

[12] The sole exception is the TN School for the Deaf, an institution that is under the governance of the state Department of Education. Interestingly, the school with the highest internet-computer to classroom ratio is another state school: Alvin C. York Institute.

[13] http://tn.ontargetus.com/TNReports/OperSys_State.asp

Section 4: Network Access and Capabilities
Portable laptop computers and wireless technologies are emerging as an important piece of the picture for network capability, both within and outside the school. Twenty percent of schools use wireless laptop computing but a significant percentage of schools (37%) have no wireless or laptop computing available. Laptops in general, however, are used more for administrative uses than for teacher or student use.

For the home-school communication item, schools checked which electronic communication methods were in place. The choices were telephone homework hotline, voice bulletins/voice mail, school or district website, and e-mail systems. The prevailing method is through a school or district website (87%), although e-mail is cited in 72% of the cases. (Ninety-five percent of districts have a home page and 73% host pages for their schools. Interestingly, only 50% of districts report having a full- or part-time web master.) Statewide it is reported that only 51% of students have Internet access at home.

In terms of the kinds of technology resources available after school hours,[14] online internet resources are the most prevalent.

Section 5: Eighth Grade Student Technology Literacy[15]
Title II Part D of No Child Left Behind says that all students are expected to be technologically literate by the time they leave the eighth grade. Never before has this been an explicit federal goal, so it offers a new challenge to educators in elementary and middle schools. To gather preliminary information about the state of student technology literacy in Tennessee, the survey asked principals to determine what percentage of their eighth graders met ten different performance indicators. These ten indicators were taken from the eighth grade performance criteria[16] from the nationally recognized work of the International Society for Technology in Education (ISTE).[17] Tennessee's curriculum standards for technology were also derived from this ISTE work[18]. Technology literacy is not one of the subject areas tested by Tennessee's student assessment program. Therefore, in reporting the percentages in this first E-TOTE year, principals also reported the process they used to determine the percentages.

According to this initial survey, eighth grade student technology literacy is not generally high across the state. The average literacy rate (across all ten factors) is 41%. Educators do not have a common method for assessing student technology literacy. Thirty percent of school principals indicated no organized way to ascertain student technology literacy while 54% reported using a student self-reported skills checklist.

Section 6: Assistive Technologies
The final survey item asked whether assistive technology is used by students with disabilities or students with learning difficulties. Assistive technology was described as portable word processors and braillers, electronic communication aids for speech or computers with adaptive devices. In aggregate, 70% of schools indicated that these technologies are used, either for students with IEPs or 504 Plans, or for students with difficulties but without special education services. However, 23% indicate that either most are aware but not trained, not aware, or a clear process is not in place for obtaining assistive technology. The other (7%) responses generally indicate that no need currently exists.

[14] http://tn.ontargetus.com/TNReports/AftHour_State.asp
[15] http://tn.ontargetus.com/TNReports/8TechLit_State.asp
[16] ISTE NETS Standards for Students: http://cnets.iste.org/currstands/cstands-netss.html
[17] We also asked principals to estimate what percentage of the entire student body met these criteria.
[18] Tennessee Curriculum Standards for grades 6-8:
http://www.state.tn.us/education/ci/cicomputered/cicomped68.htm

Process Observations

Data Collection Notes
Timeframe: The data collection period for E-TOTE 2003 extended from December 19, 2002, through March 30, 2003. This extended period permitted schools time to acclimate to the new survey. In some cases, this was the first comprehensive technology survey a school completed, so additional time was required. In the future, the data entry period will be condensed.

Participation: Completing the E-TOTE survey in a timely manner is required of all districts that receive Title II Part D funds. Full participation was achieved for E-TOTE 2003.

Exceptions: The 2003 survey collected information from some Adult High Schools throughout the state. However, their data were not included in the district averages. This was because the students enrolled in these schools typically follow highly individualized schedules that tended to skew the numbers used to calculate student to computer ratios and computers per classroom. In some cases, these schools were located in facilities that were either not owned or operated by the local school district. These schools were encouraged to complete the surveys so they could compare their own picture with district and statewide averages. A more informed decision needs to be made regarding these schools in future data collections.

Future Directions
With each subsequent year's E-TOTE data survey, longitudinal analysis will be possible. In order to compare survey data from year to year, the same basic questions will be asked.

Ambiguous items will be clarified, however, and a few items may be added to support a more thorough analysis of the state of technology in the state of Tennessee schools. It is possible that different items for the Digital Divide analysis may be selected to highlight where the divide may exist. Data elements which the U. S. Department of Education intends to incorporate into its common data collection process will necessarily have to be included in the annual E-TOTE survey. In some cases, this will only slightly modify existing data elements. In other cases, some new items will need to be incorporated into the future survey.

Tools to help principals gather data more reliably are being developed at the national level and will be available. A state initiative to develop performance-based tools that teachers may use for assessing student technology literacy is underway as part of the statewide competitive technology grants funded by Title II Part D in the EdTech LAUNCH schools.

Tennessee State Technology Plan
Collecting and synthesizing the data from the 2003 E-TOTE survey is a key component of the needs analysis for Tennessee's Technology Plan. The core components of this plan were constructed in direct response to the requirements of the Enhancing Education Through Technology legislation and submitted as part of the state's consolidated application to the U. S. Department of Education. Those core elements are available at http://www.state.tn.us/education/acctedtech5.htm and were posted on the web in October, 2002.

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June 2003; revised October 2003